CLAIMS

1. An electric machine, comprising:

a stator; and

a rotor core mounted for rotation with respect to the stator, the rotor core comprising a number of a magnet slots and at least one non-magnetic structure formed at a rotor core internal location proximate to an expected pole location of a magnet emplaced in the magnet slot.

2. The electric machine of claim 1 wherein each of the magnet slots comprises a portion having a shape complimentary to a shape of at least a portion of the magnet.

3. The electric machine of claim 2 wherein the portion of the magnet slot having the complimentary shape is elongated.

4. The electric machine of claim 1 wherein the at least one non-magnetic structure formed at a rotor core internal location proximate to an expected pole location of a magnet emplaced in the magnet slot comprises an end of the magnet slot abutting at least one non-magnetic region having a width in excess of a width of the magnet slot where at least a portion of the magnetic slot is substantially magnet-shaped.

5. The electric machine of claim 4 wherein the at least one non-magnetic region having a width in excess of a width of the magnet slot comprises a substantially bulbous region.

6. The electric machine of claim 1 wherein each of the magnet slots further comprises:

at least one notch disposed substantially along a side of the respective ones of the magnet slots.

7. The electric machine of claim 1 wherein the at least one non-magnetic structure formed at a rotor core internal location proximate to an expected pole location of a magnet emplaced in the magnet slot further comprises:

a filler forming at least a part of the at least one non-magnetic structure.

8. The electric machine of claim 7, wherein the filler comprises at least one of air, an epoxy, a resin, and an adhesive.

9. The electric machine of claim 1, further comprising:

a number of permanent magnets, each of the permanent magnets disposed within a respective one of the magnet slots.

10. The electric machine of claim 9, further comprising:

a filler disposed within the magnet slots.

11. The electric machine of claim 9, further comprising:

a number of non-magnetic wedges, each non-magnetic wedge disposed adjacent to a respective one of the permanent magnets to establish a movement-resistant friction fit between the permanent magnet and the magnet slot.

12. An electric machine, comprising:

a stator;

a rotor mounted for rotation with respect to the stator, the rotor comprising a number of magnet slots, each slot comprising opposed end portions and a central portion disposed between the end portions, the central portion of each of the magnet slot slots shaped to complimentarily receive a magnet; and

a number of magnets complimentarily received in the central portions of the magnet slots of the rotor.

13. The electric machine of claim 12, further comprising:

a filler received in the end portions are of the magnet slots.

14. The electric machine of claim 13 wherein the filler is selected from the group consisting of at least partially filled with at least one of air, an epoxy, a resin, and an adhesive.

15. The electric machine of claim 12, further comprising:

a load absorbing material filling at least a portion of each of the end portions of the magnet slots.

16. The electric machine of claim 12, wherein the end portions the magnet slots have a width greater than a width of the central portion of the magnet slots.

17. The electric machine of claim 12, wherein the end portions of the magnet slots are substantially bulbous-shaped.

18. A method for use with an electric machine, comprising:

rotating a rotor having at least one load absorbing structure interposed between a magnet slot and a rotor core material.

19. The method of claim 18, wherein the at least one load absorbing structure interposed between a magnet slot and a rotor core material comprises at least one of air, epoxy, resin, and adhesive.

20. The method of claim 18, wherein the at least one load absorbing structure further comprises a bulbous portion.

21. The method of claim 18, wherein the at least one load absorbing structure further comprises:

the magnet slot formed contiguous with the at least one load absorbing structure.

22. A method of forming an electric machine, comprising:

providing a number of rotor laminations each having a number of slots, wherein the slots comprise a trapezoidal shaped portion and bulbous shaped portions disposed at both

ends of the trapezoidal shaped portion, and wherein the slots further comprise at least one notch disposed at points where the trapezoidal shaped portion and the bulbous shaped portions meet;

laminating the rotor laminations to form a rotor lamination stack;

disposing a respective one of a number of permanent magnets into each of the slots of the rotor lamination stack;

inserting a non-magnetic wedge adjacent to the permanent magnets;

inserting a filler into the bulbous shaped portions of each of the slots; and

mounting the rotor lamination stack for rotation with respect to a stator.

23. The method of claim 22 wherein said inserting a filler into the bulbous shaped portions comprises inserting at least one of air, epoxy, resin, and adhesive.

24. The method of claim 22 further comprising:

positioning the bulbous shaped portions to reduce magnetic leakage from the permanent magnets through a rotor material located exteriorly to the permanent magnets.

25. The method of claim 22, further comprising:

configuring the at least one notch to exert a wedging force on the respective one of the permanent magnets and thereby prevent the permanent magnet from moving within the respective one of the slots.

26. A rotor assembly of an electric machine, comprising:

a lamination layer configured to be axially stacked in a series of lamination layers to form a rotor core of an electric machine;

the lamination layer forming at least a part of at least one internal slot, each internal slot comprising an elongate portion and at least one expanded end portion disposed at one end of the elongate portion; and

a permanent magnet disposed within each internal slot.